



## Table of Contents

|  |    |
|--|----|
| Message from the Science Department..... | 2  |
| Working Scientifically.....              | 3  |
| Introduction to Biology Task 1&2.....    | 6  |
| Introduction to Biology Task 3&4.....    | 7  |
| Introduction to Biology Task 5.....      | 8  |
| Introduction to Biology Task 6.....      | 9  |
| Introduction to Chemistry Task 1.....    | 10 |
| Introduction to Chemistry Task 2.....    | 11 |
| Introduction to Chemistry Task 3.....    | 12 |
| Introduction to Physics Task 1&2.....    | 13 |
| Introduction to Physics Task 3&4.....    | 14 |
| Introduction to Physics Task 5.....      | 15 |
| Answers.....                             | 16 |

## Message from the Science Department

We are looking forward to meeting you in September but until then we have put together a pack of work to help during lockdown to continue to develop your scientific skills.

In this pack there are some activities that you will do during your time at The Prescott School along with some very simple practical activities for you to try at home – you should find most of the things that you need in your kitchen cupboards! If you are stuck scan the QR code next to the task to help you.

At The Prescott School we want you to enjoy your time in science. Regardless of what job you want to do in the future, having knowledge of science will help you understand and appreciate the world around you. We want to make sure that you leave The Prescott School fully equipped with the scientific knowledge and skills that you need to have the best options available to you.

Good luck and we will see you in September,

*Mr Gregory*

Director of Science

## Working Scientifically

One of the things we are sure you'll enjoy most about science at The Prescot School is the practical work you will be able to do. You will be planning your own investigations before completing them in our laboratories, and then working individually or as a team to gather a set of results that you can analyse and evaluate.

You have probably carried out a number of investigations already in your primary school. You may already be used to using what we call 'variables.' In secondary science we use 3 types of variables:-

**Independent** Variable – This is what we **change** in an investigation

**Dependant** Variable – This is what we **measure** in an investigation

**Control** Variable - This is what we **keep the same** during an investigation

Here's a simple example of an investigation ....

Homer has just been picked for a bowling tea. He has rubber shoes, leather shoes and plastic shoes. He tests each shoe by running 2 meters and then measures how far he slips down the alley. He wants to find out which shoe gives him the least amount of slip.



The Independent variable is what he **changes** – his shoes.

The dependant variable is what he **measures** – how far he slips down the alley.

The control variable is what he **keeps the same** – how far he runs before he slips.

On the following page there's some more investigations for you to read about. See if you can identify the variables.

## Working Scientifically

Lisa decides to test how the length of rope will affect the number of skips in 10 minutes. She has three different sizes of ropes -1 meter, 2 meters and 3 meters. She asks Marge to time her using a stopwatch and she asks Bart to count the number of skips.

1. What was Lisa's independent variable (the thing she changed)?

\_\_\_\_\_

2. What was Lisa's dependant variable (the thing she measured)?

\_\_\_\_\_

3. What was Lisa's control variable (the things she kept the same)?

\_\_\_\_\_

On the way home from school Bart and Millhouse stop off at the skate park. The two of them decide to have a downhill race on their skate boards over a distance of 10 metres. For a challenge, Bart thinks it would be a good idea for both of them to put different numbers of school books on their heads. They get Lisa to time them and calculate their speed.

4. What was their independent variable (the thing they changed)?

\_\_\_\_\_

5. What was their dependant variable (the thing they measured)?

\_\_\_\_\_

6. What was their control variable (the things they kept the same)?

\_\_\_\_\_



## Working Scientifically

How many balloons does it take for Maggie to fly away? Bart and Maggie are playing with balloons. Bart blows each balloon up with 4 puffs of helium. He gives them to Maggie one by one and times how long it takes her to start floating off the ground.

What was their independent variable? \_\_\_\_\_

What was their dependant variable? \_\_\_\_\_

What was their control variable? \_\_\_\_\_



## Introduction to Biology

Biology is the scientific study of living things, which we call 'organisms'. The following 6 short tasks will require you to gather data and answer simple questions about the natural world and humans as living things. You can complete the tasks on these pages.

### Task 1

### Special features of birds

In a local park, choose a bird to watch closely.

- Label the parts of the bird's body on the diagram.
- Why do you think the bird needs wings?  
.....
- Why does it have claws?  
.....
- Why does the bird have feathers?  
.....



### Task 2

### Parts of a leaf

On a visit to a park or on a walk, find a tree and collect a leaf. Use books or the Internet to identify the tree from the leaf.

In the space below, draw the leaf and label as many parts as you can.

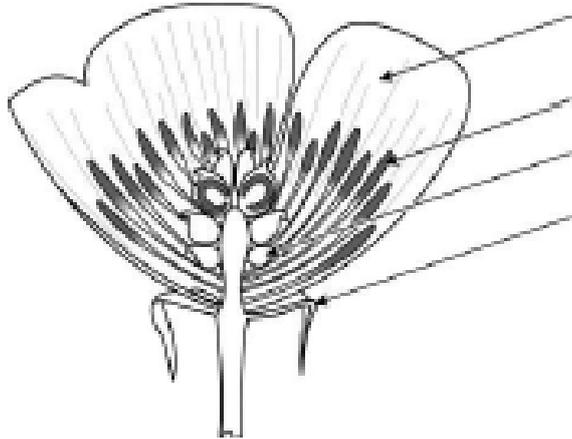


Task 3



### Parts of a flower

Label this diagram of a buttercup flower, which has been cut in half.



Task 4



### Local wildlife

Think about the living things that you might find in your garden, or in a local park. List as many organisms from your area as you can. Divide the list into producers, herbivores, and carnivores.

Producers

Herbivores

Carnivores

Task 5

### Healthy eating

During the summer holiday, find three different chocolate bars of your choice, or three different soft drinks of your choice.

Look for the nutritional on the wrappers or bottles. Fill in the table below with the nutritional information about the bars or drinks.

| Name of chocolate bar or soft drink | Carbohydrates (per 100 g) | Fats (per 100 g) | Protein (per 100 g) | Calories |
|-------------------------------------|---------------------------|------------------|---------------------|----------|
|                                     |                           |                  |                     |          |
|                                     |                           |                  |                     |          |
|                                     |                           |                  |                     |          |

Which of the chocolate bars or drinks is the healthiest? Use your table to help you decide.

.....

.....

### The human heart

Answer these questions using what you know about the human heart.

Where is the heart found in your body? .....

What does the heart do? .....

Your pulse measures how many times your heart beats in one minute.  
Your pulse goes up when you exercise.

- Record your pulse when you are resting, and fill in the table.
- Now jog on the spot or do star jumps for two minutes.
- Measure your pulse again and fill in the table.

| Resting pulse<br>(beats per minute) | Pulse after exercise<br>(beats per minute) |
|-------------------------------------|--|
|                                     |  |

What is the effect of exercise on your pulse rate? Use your table to help you decide.

.....

.....

## Introduction to Chemistry

Every day, scientists do investigations and make observations to answer questions in Chemistry. These scientists are called Chemists. Chemists work out why materials have certain properties. They find out how materials change in chemical reactions. They create new materials, with perfect properties for particular purposes.

### Task 1

Go to the following website:-

<http://www.rcs.org/learn-chemistry/collections/chemistry-calender>



Click on your birthday. Fill in the following form to show others in your new class why your birthday is important in chemistry.

### **Why is my birthday important in chemistry?**

Name: \_\_\_\_\_

My birthday is on: \_\_\_\_\_

The name of my chemist is: \_\_\_\_\_

My chemist is from this country: \_\_\_\_\_

This is what my chemist did: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Here is a picture of my chemist, or of something my chemist discovered.

# Introduction to Chemistry

## Task 2

Chemists make materials that are suitable for their purpose. In this activity, you will work out why objects are made from certain materials.

Find 5 objects at home that are made from different materials. Fill in the following table to show why the objects are made from their materials. The first line is already filled in for you.



| <b>Object</b> | <b>Material the object is made from</b> | <b>Properties of the material that make it suitable for the object</b>                   |
|---------------|---|--|
| frying pan    | metal                                   | <ul style="list-style-type: none"><li>• good conductor of heat</li><li>• rigid</li></ul> |
|               |   |  |
|               |   |  |
|               |   |  |
|               |   |  |
|               |   |  |

## Task 3

**Sugar or salt?**

In this activity you will plan and do an investigation to answer this question: **Can you dissolve more sugar, or more salt, in a glass of water?**

**My plan**

- Complete the table.

| Variable                  | Will I change it or measure it or keep it the same? |
|---------------------------|---|
| substance (sugar or salt) |   |
| amount that dissolves     |   |
| volume of water           |   |
| temperature of water      |   |

- Write down what you will do.

---

---

**My results**

| Substance |  |
|-----------|--|
| Sugar     |  |
| Salt      |  |

**What I found out**

---

---

## Introduction to Physics

Physics is a branch of science that studies matter and its motion as well as how it interacts with energy and forces. Physics studies the smallest and simplest particles and atoms as well as the largest stars and the Universe. Scientists who are experts in physics are called physicists. Have a go at the following tasks.

### Task 1

Use the internet to help you draw this circuit. You will be able to find and recollect the symbols for each of the things that are in the circuit. Please draw the circuit in a single loop.

**Circuits**



Can you draw a simple circuit that you would find in a torch? Include these things:

battery                      bulb                      switch



### Task 2

**Forces**

Some types of force slow us down when we are moving. Fill in the blanks, using the words below:

water resistance                      air resistance                      drag

- A force that slows me down when I run is .....
- A force that slows me down when I swim is .....
- A force that slows me down when I cycle is .....

## Introduction to Physics

### Task 3

Use a magnet to test materials to find out if they are magnetic or not. No Magnet? No problem – use a fridge magnet!

### **Magnets**



List some objects that are magnetic and some that are not.

|                 |                     |
|-----------------|---------------------|
| <u>Magnetic</u> | <u>Not magnetic</u> |
|-----------------|---------------------|

### Task 4

Watch the sun at different times of the day. Fill in the following table to describe it's height and where it is in the sky, it's colour and size change in the evening or at dawn.

### **The Sun**

Check the Sun's position several times in one day and write the changes.  
***Warning: Never look directly at the Sun!***

| Time | Height in sky | Position |
|------|---------------|----------|
| 7 am |               |          |
| Noon |               |          |
| 4 pm |               |          |
| 9 pm |               |          |

Task 5

Watch the Moon for a week and fill in the following table, use diagrams of the Moon if you wish.

### The Moon

Watch the moon every night for a week. Write down what it looks like each day. Think about its shape, and brightness.

| Day       | How the Moon looks |
|-----------|--------------------|
| Monday    |                    |
| Tuesday   |                    |
| Wednesday |                    |
| Thursday  |                    |
| Friday    |                    |
| Saturday  |                    |
| Sunday    |                    |

## Answers

Answers have been provided for some tasks. Some will depend on your own investigations and observations

### Working scientifically – variables

1. Size of the rope
2. Number of skips
3. Time – 10 minutes
4. Number of books
5. Time taken/speed
6. Distance – 10m
7. Number of balloons
8. How long it takes for her to start floating
9. Number of puffs of helium (4)

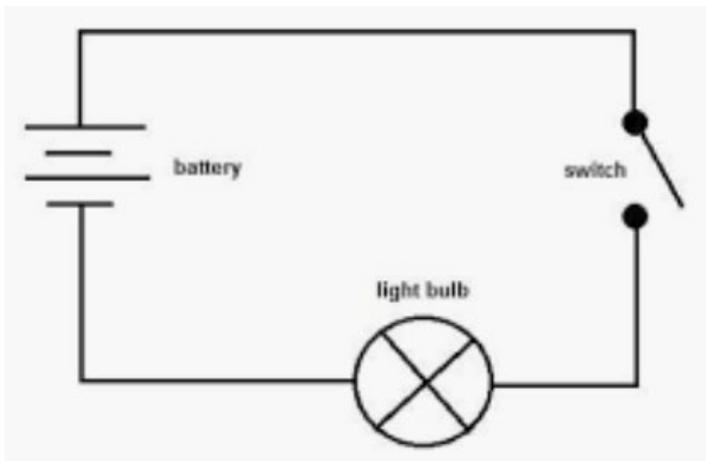
### Biology - Task 1

- Eye, beak, wing, claws
- To help it to fly
- To grip tree branches and food
- To help it to fly and keep warm

### Biology - Task 3

- Petal, anther, nectary, sepal

### Physics - Task 1



### Physics - Task 2

- Air resistance
- Water resistance
- Drag